Orange County Sanitation District
Source Control Division

Pre-Permit Inspection Report
(PPIR)

Permit Number:	11-1-089	Prepared by:	Tran, Jane H.
Company Name:	CAL-AURUM INDUSTRIES INC.	Date Inspected:	03/12/13
Sewer Address:	15632 CONTAINER LANE HUNTINGTON BEACH 92649	Contact:	PAUL A. GINDER PRESIDENT

Description of Facility Operations

CAL-AURUM INDUSTRIES INC. (Cal-Aurum) performs surface finishing on aluminum, copper, mild and stainless steels, and kovar (nickel/iron alloy) parts. The facility is a large job shop exclusively dedicated to processing customer-supplied parts. Cal-Aurum specializes in precious metals plating, providing services for aerospace, communications, electronics, and military applications. The wet processing proceeds by rack, barrel, and continuous reel-to-reel techniques. The effluent discharge at Cal-Aurum is composed of the various spent process solutions and associated rinse wastestreams generated during the cleaning, coating, common and precious metals electroplating, electroless plating, etching, finish stripping, and rinsing of parts. The operations are housed in one building.

Operation(s) that do not generate wastewater include masking, and hole plugging.

Waste/Wastewater generating operation(s) include 60/40 tin/lead plate, 90/10 tin/lead plate, acid activator, acid cleaner, acid cleaning, acid dip, acid etch, acid predip, Actane activator, albaloy plate, alcohol cleaner, alkaline cleaner, anti-tarnish dip, bright dip, bright nickel plate, bright silver plate, bright tin, bright tin plate, bright tin/lead plate, brite dip, cascade rine, cascade rinse, cobalt/gold plate, copper drag-out, copper plate, copper strike, Cu strike, D.I. rinse, deox clean, deox cleaner, DI drag-out, DI rinse, dishwasher, drag-out, dragout rinse, dull tin/lead plate, EDTA rinse, electrocleaner, electroless nickel plate, empty, gold drag-out, gold plate, gold plate (E94 Ni), gold strike, gold strip, gold strip drag-out, H2SO4 acid dip, H2SO4 predip, HCL acid dip, HCL dip, hot D.I. rinse, hot DI, hydrochloric acid, Ni strike, nickel activator, nickel drag-out, nickel plate, nickel strike, nitric acid, nitric acid dip, not in use, palladium Ni, rhodium plate, running rinse, save this space, silver drag, silver plate, silver plate (mate), silver strike, soak cleaner, soap cleaner, solder strip, spray rinse, sulfuric acid, tin plate, ultrasonic cleaner, water shedder, Watts Ni plating, watts nickel plate, and zincate.

Description of Waste/Wastewater Controls

Waste/Wastewater Controls Using Dragout Reduction

One of the most critical components for effective waste/wastewater control is minimizing dragouts. Reducing dragout will extend bath life, minimize and help stabilize the loading to the pretreatment system, and reduce chemical costs for replenishment and treatment.

Process baths at Cal-Aurum are heated which helps reduce dragouts. Because the viscosity and surface tension of the solution are typically lower when the temperature is raised, the heated solution drains off the

parts more quickly, thereby reducing the amount of dragout. In addition, the evaporation makes room for replenishing from the static dragout tank. At Cal-Aurum, the alkaline cleaner, copper plate, gold plate, nickel plate, and rhodium plate process tanks are heated.

Cal-Aurum uses static dragout tanks as the initial rinse following certain process tanks. The use of static dragout tanks after the process baths helps to recapture process solution that adheres to the workpiece. The contents of the static dragout tanks are returned to the bath to compensate for evaporative losses, sent to the batch pretreatment system, or wastehauled. This reduces the amount of solution carried over into the subsequent rinse or process tanks which helps extend their useful life. At Cal-Aurum, the dragout rinses after the cyanide copper plate, copper strike, electroless nickel, and gold plate processes are returned to the bath.

Rinsing/airflow methods are not used at Cal-Aurum to aid in the removal of dragout solution from parts. The use of spray or fog rinses above heated process baths or a subsequent static rinse tank can help recover dragout on the workpiece.

Cal-Aurum uses spray rinses in combination with immersion rinsing. Because a spray rinse is used in place of the initial running rinse, most dragout on the workpiece is removed while generating less wastewater. The wastewater generated is concentrated, allowing the opportunity to recycle it into the process bath to compensate for evaporation.

Cal-Aurum does not use hoists and/or drip bars which allow the employees to hang workpieces so the process solution drains back into the process tanks. Because of this, there is a tendency for parts to be quickly transferred on to the next tank/rinse resulting in more solution dragout. Drip bars and/or hoists will reduce the strain on the employees as they move the workpieces between tanks. Reducing the strain or effort improves the chances that the employees will take the extra time to allow sufficient draining.

Cal-Aurum utilizes strategic positioning of each workpiece on the rack to reduce the dragout. Because dragout is trapped in grooves or cavities present in or on workpieces as they are withdrawn from solution, consideration is taken as to how the pieces are positioned for immersion. This facilitates drainage of the solution in a consolidated manner while minimizing the amount trapped or dropped on to other pieces.

Drain boards or contiguous tanks are used to eliminate the space between tanks. As parts are moved from tank to tank, solution drips off the parts. The drain board captures the drops and returns the solution to the appropriate bath, while preventing spillage to the floor. With contiguous tanks, the solution drains directly back into the tank.

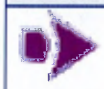
Waste/Wastewater Controls Using Water Reduction - Rinse Controls

Water reduction through rinse controls is an effective method for waste/wastewater control. Common rinse controls include the use of flow restrictors, "on-demand" rinse flow, and closed loop rinse systems.

Shut-off valves are installed upstream of individual rinse stages enabling Cal-Aurum to conserve water and reduce the volume of water that needs to be treated. The valves limit the overall volume of rinse water used by allowing the individual rinse stations to be shut off when work is not being processed. This reduces the hydraulic demand and allows better control of the feed rates across the final neutralization system.

Cal-Aurum uses on-demand flow controls on most of their cascade and running rinses. Timers activate rinses only when parts are being processed, thus reducing the volume of contaminated rinse wastewater that needs to be treated. On-demand controllers were not currently installed on cascade rinse tanks 159, 207, 210, 214, or 222. The timer on cascade rinse tank 136 was out-of-order.

Waste/Wastewater Controls Waste Management of Spent Solutions



Spent solutions can be a major source of variability that affects compliance because of the heavy pollutant loadings that can potentially impact the performance of the treatment system. Many methods are available to efficiently control and treat spent solutions. These include bath maintenance, evaporation of the plating bath solution, reclamation of chemicals by the supplier, recovering of metals and metal salts, reusing baths as pH adjusters, treating the spent solutions with a dedicated batch system, off-site disposal, and metering the spent solutions into the continuous pretreatment system.

At Cal-Aurum they extend the life of such baths by removing contaminants using filtration & skimming of oils.

Cal-Aurum uses chemical products from chemical manufacturers that allow spent chemicals to be returned for recycling. Sending spent chemicals back to the manufacturer for recycling or reclamation, reduces the volume of spent chemicals treated onsite. At Cal-Aurum, the gold, palladium, rhodium and silver process baths are returned to the chemical supplier for reclamation.

Cal-Aurum recovers metals and metal salts from process baths using electrolytic recovery (electrowinning). Recovering metals and metal salts from a process bath not only reduces the pollutant loading on the pretreatment operations, but in some instances allows the reuse of the process solution, thereby reducing the amount of pollutants discharged to the sewer. At Cal-Aurum, copper contaminants are dummy-plated out of the nickel and tin plating baths to increase the life of these solutions.

Cal-Aurum generates spent acid or alkaline solutions that are typically discarded when contaminants exceed an acceptable level. Cal-Aurum uses some of their spent solutions for pH adjustment in the batch treatment process, taking advantage of the opportunity to minimize chemical costs and reduce waste generation.

Concentrated spent solutions and dragout rinses are either treated using a separate batch treatment system, or wastehauled offsite. This reduces the pollutant loadings from spent solutions, thus reducing the concentration of contaminants discharged to the sewer. Off-site disposal eliminates the need to treat and sewer the material.

Waste/Wastewater Controls Using Segregation

Segregation of wastestreams prior to comingling with other wastestreams can improve the efficiency of the preatreatment system and will result in lower treatment cost. Wastestreams requiring pollutant-specific treatment should be kept separate to ensure that only those wastewater requiring specific treatment are treated, and not all of the wastes, which could increase the chemical usage and sludge volume.

Cal-Aurum does not completely segregate its wastestreams. Although all of the concentrated spent solutions and dragout rinses are either batch pretreated or wastehauled, the dilute cyanide and complexed metal bearing running rinses are directed to the sewer after receiving pH neutralization only and some bleach addtion. As a result, wastewater control is diminished, which can potentially cause variabilities in the effluent discharge.

Cyanide-bearing wastestreams must be segregated to destroy cyanides by oxidation before the metals are removed by precipitation. Wastestreams containing hexavalent chromium should also be segregated so they can be chemically treated to reduce the hexavalent chromium to trivalent chromium. Once chrome reduction has been achieved, the trivalent chromium is can treated with other metals by chemical precipitation. Because complexed metal wastes prevent metal precipitates from forming and settling out, they must also be segregated and treated individually to break up the metal complexes prior to precipitation. Acidic or alkaline wastestreams that do not contain metals can also be segregated and simply neutralized prior to discharge.

Wastestreams with low contaminant concentrations, typically from rinsing operations, are separated from the highly concentrated solutions generated during the peroidic dumping of spent process solutions. By segregating wastestreams based on strength, Cal-Aurum reduces variabilities resulting from wide fluctuations in the concentration level of raw wastestreams. Wastewater control is marginally achieved by

providing separate batch treatment, or wastehauling, for spent concentrated solutions, which would otherwise overwhelm the effluent discharge. The dilute cyanide, chrome, and complexed metal (electroless nickel) bearing running rinses are directed to the sewer without receiving pretreatment to destroy cyanide, reduce chrome, break complexes, or remove metals.

Waste/Wastewater Controls Using Pretreatment System

Adequate design and reliable operation of a pretreatment system is critical for maintaining compliance. Within the pretreatment system, good controls will eliminate variabilities affecting the performance of the pretreatment system.

Cal-Aurum has contaminated wastestreams that require pretreatment prior to discharge to the sewer. Therefore, the use of a pretreatment system is necessary to provide good wastewater control to meet consistent compliance. Cal-Aurum has operations that generate categorical wastestreams. Cal-Aurum utilizes a batch pretreatment system for treating spent solutions. The contaminated rinses received only pH adjustment and bleach addtition (not 2-stage CN destruction) prior to discharge to the sewer. This practice may not guarantee consisten and long-term compliance.

Flow equalization is used to dampen the influent wastewater flowrate and concentration so that a constant or nearly constant flowrate and concentration are achieved. Flow equalization is used to overcome the operational problems caused by flowrate variations, improve the performance of the downstream processes, and reduce the size and cost of downstream treatment units. At Cal-Aurum, individual equalization tanks are utilized for each of the segregated wastestreams prior to treatment.

Cal-Aurum uses a filter press for dewatering the sludge from the batch treatment. The filtrate generated typically contains heavy metals that pass through the filter cloth. At Cal-Aurum, the filtrate is not discharged directly to the sewer but is pumped to a final polishing filter and holding tank and tested for compliance prior to discharge.

The use of proper instrumentation and control to measure and achieve desired operational parameters, coupled with regular calibration and maintenance are essential for reliable operation. At Cal-Aurum, pH adjustment is manually conducted with a hand-held pH meter at the batch treatment system. This practice may cause consistency problem due to human errors.

Wastewater treatment operators play a key role in the operation of the pretreatment system. At Cal-Aurum, pretreatment operators are provided during all shifts of discharge. All treatment operators have formal training/certification in wastewater treatment. Training/Certification include CWEA Certification. Having trained operators help ensure proper operation and maintenance of the pretreatment system. At Cal-Aurum, an Operations and Maintenance (O/M) Manual is available to guide the operators. The O/M Manual is available in English.

Waste/Wastewater Controls Through Environmental Management Practices

Management commitment to achieve environmental compliance is a principal component for effective waste/wastewater control.

One way the management can demonstrate its commitment to environmental or regulatory compliance is through a written company policy. At Cal-Aurum, a written policy or mission statement forms the basis for the company's routine business practices pertaining to compliance.

Cal-Aurum conducts additional self-monitoring beyond the minimum required frequency. Additional sampling and analysis of the wastewater discharge helps to ensure that noncompliance problems are identified and resolved quickly. Monitoring ranges from instant grab samples to 24-hour composites. Samples for effluent monitoring are analyzed on-site, which provides immediate feedback about the compliance status of the discharge, prompting immediate adjustments and corrective actions to achieve compliance.

Cal-Aurum maintains records of its pretreatment system status, equipment maintenance (PTS and/or Process), chemical supply (PTS), and sampling and analysis results. Maintaining logs and records is important for a company to understand its maintenance needs, chemical use, and operating parameters. The records provide an in-depth understanding of daily operations, supply useful information for improving pretreatment system performance and/or diagnosing problems that arise, and ensure that needed maintenance is not overlooked.

Cal-Aurum has a company policy empowering the treatment operators, or other personnel, to shut down the wet processes when a pretreatment upset occurs. This authorization allows the treatment operators to correct the problem and restore the system to proper operating conditions, thereby preventing any further noncompliant discharge.

The permittee has an updated slug control plan or equivalent on site.

Slug Control Plan Notification procedure and information is posted at permittee location.

Recommendations for Improvement

Waste/Wastewater Controls Using Dragout Reduction

- Use spray or fog rinse systems above heated baths to recover dragout on the workpiece. Purified water should be used for these systems in order to reduce bath contamination from the rinse water. The spray rinse flow rate should be adjusted to be equal to the evaporation rate of the tank so it can be used to replenish evaporation losses. As the workpiece rack is raised above the process tank, air can be blown at the workpieces to improve the drainage of the dragout solution into the process bath. High humidity air can be used in order to counteract workpiece drying.
- Use drip bars and/or hoists to hang workpieces, thus eliminating the need for operators to manually lift and hold workpieces to drain process solution back into the process tanks. Such devices reduce the strain on the operators as they move workpieces between tanks.
- Implement measures that allow the workpiece to be slowly removed from the process bath. The faster a workpiece is removed from the process bath, the thicker the film on the workpiece surface and thus, the greater the dragout volume. The effect is so significant that most of the time allowed for rack drainage should instead be dedicated to withdrawal from the tank. Remember to allow sufficient time to drain process solution back into the process tank before moving the part to the next tank.

Waste/Wastewater Controls Using Segregation

- Segregate wastestreams by type for more effective treatment of wastewater. Segregating waste streams is essential for most recycling, recovery, and treatment technologies, since other waste, if mixed, can disrupt the process. The chemical properties of a wastestream must be understood in order to assess the potential for reuse, recycling, recovery, and treatment. Examples of segregated wastestreams by type: acidic vs. alkaline; chrome vs. non-chrome; chelated vs. non-chelated streams; cyanide vs. non-cyanide.

Waste/Wastewater Controls Using Pretreatment System

- Install adequate instrumentation and automatic process control system for reliable operation of the pretreatment system.

Sources of Waste/Wastewater and Destination

			Pollutants									Rinse Strategy								Group Destination																	
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None	Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS			
1	A1	gold strike	✓		✓	✓												✓								✓											
2	A2	dragout rinse			✓	✓												✓								✓											
3	A3	gold plate	✓		✓	✓												✓								✓											
4	A4	rhodium plate	✓			✓												✓								✓											
5	A5	cascade rinse			✓	✓							2				✓													✓							
6	A6	nickel plate	✓			✓												✓							✓												
7	A7	zincate	✓			✓												✓							✓												
8	A8	not in use									✓							✓															✓				
9	A9	running rinse				✓						✓					✓													✓							
10	A10	cascade rinse				✓							2				✓													✓							
11	A11	nitric acid				✓												✓							✓												
12	A12	Actane activator	✓			✓												✓							✓												
13	A13	Actane activator	✓			✓												✓							✓												
14	A14	running rinse				✓						✓				✓														✓							
15	A15	not in use									✓							✓															✓				
16	A16	soak cleaner	✓			✓												✓							✓												
17	B18	dull tin/lead plate	✓			✓												✓								✓											
18	B1.5	dragout rinse				✓									✓										✓												
19	B2	acid predip	✓			✓												✓							✓												
20	B3	90/10 tin/lead plate	✓			✓												✓								✓											
21	B4	bright tin/lead plate	✓			✓												✓								✓											
22	B5	60/40 tin/lead plate	✓			✓												✓								✓											
23	B6	bright tin	✓			✓												✓								✓											
24	B7	bright tin plate	✓			✓												✓								✓											
25	B8	cascade rinse				✓							2																	✓							
26	B9	tin plate	✓			✓												✓								✓											
27	B9.5	nitric acid dip	✓			✓												✓								✓											
28	B8.5	H2SO4 acid dip	✓			✓												✓							✓												
29	B10	deox clean	✓			✓												✓							✓												

			Pollutants									Rinse Strategy								Group Destination															
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None	Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS
30	B11	DI drag-out	✓			✓									✓											✓									
31	C1	electrocleaner	✓			✓												✓								✓									
32	C2	electrocleaner	✓			✓												✓								✓									
33	C2.5	cascade rinse				✓							2				✓													✓					
34	C3	acid activator	✓			✓												✓								✓									
35	C4A/B	acid etch	✓			✓												✓								✓									
36	C5	cascade rinse				✓							2				✓													✓					
37	C6	copper plate	✓		✓	✓												✓									✓								
38	C7	copper plate	✓		✓	✓												✓									✓								
39	C8	dragout rinse			✓	✓									✓														✓	✓					
40	C9	cascade rinse			✓	✓							2				✓													✓					
41	C9.5	D.I. rinse				✓									✓											✓									
42	C10	DI rinse				✓									✓															✓					
43	C11	silver drag			✓	✓									✓												✓								
44	C12	silver plate	✓		✓	✓												✓									✓								
45	C13	silver plate	✓		✓	✓												✓									✓								
46	C14	cascade rinse				✓							2				✓													✓					
47	C16	nickel plate	✓			✓												✓								✓									
48	C17	nickel plate	✓			✓												✓								✓									
49	C18	nickel plate	✓			✓												✓								✓									
50	D0	water shedder	✓			✓												✓								✓									
51	D1	hot D.I. rinse				✓									✓														✓						
52	D2	cascade rinse				✓							2				✓													✓					
53	D3	albaloy plate	✓			✓												✓									✓								
54	D4	gold drag-out			✓	✓									✓												✓								
55	D5	gold plate	✓		✓	✓												✓									✓								
56	D6	silver plate (mate)	✓		✓	✓												✓									✓								
57	D7	silver strike	✓		✓	✓												✓									✓								
58	D7.5	drag-out			✓	✓									✓												✓								
59	D8	bright silver plate	✓		✓	✓												✓									✓								
60	D9	silver strike	✓		✓	✓												✓									✓								
61	D10	bright nickel plate	✓			✓												✓								✓									

			Pollutants										Rinse Strategy								Group Destination															
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None	Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS
62	D11	nickel drag-out				✓									✓											✓									
63	D12	watts nickel plate	✓			✓												✓								✓									
64	D13	cascade rinse				✓							2				✓													✓					
65	D14	dragout rinse				✓									✓											✓									
66	D15	nickel plate	✓			✓												✓								✓									
67	D16	nickel plate	✓			✓												✓								✓									
68	D17	nickel plate	✓			✓												✓								✓									
69	D18	nickel plate	✓			✓												✓								✓									
70	F1	hot D.I. rinse				✓									✓											✓									
71	F2,2.5	hot D.I. rinse			✓	✓									✓											✓									
72	F3	nickel strike	✓			✓												✓								✓									
73	F5	palladium Ni	✓			✓												✓									✓								
74	F6	cascade rinse				✓							2				✓													✓					
75	F6A	gold strip drag-out			✓	✓									✓												✓								
76	F6	gold strip	✓		✓	✓												✓									✓								
77	F8	deox cleaner	✓			✓												✓								✓									
78	F10	gold plate (E94 Ni)	✓		✓	✓												✓									✓								
79	F11	spray rinse			✓	✓								✓																✓					
80	F12	gold plate	✓		✓	✓												✓									✓								
81	F13	gold drag-out			✓	✓									✓												✓								
82	F14	gold plate	✓		✓	✓												✓									✓								
83	F15	gold plate	✓		✓	✓												✓									✓								
84	F16	acid dip	✓			✓												✓								✓									
85	F16.5	cascade rinse				✓							2				✓													✓					
86	F17	gold plate	✓		✓	✓												✓									✓								
87	F18	gold drag-out			✓	✓									✓												✓								
88	F19	gold strike	✓		✓	✓												✓									✓								
89	F20	DI rinse			✓	✓									✓												✓								
90	G1	alkaline cleaner	✓			✓												✓								✓									
91	G2	alkaline cleaner	✓			✓												✓								✓									
92	G3	cascade rinse				✓							2				✓													✓					
93	G4	hydrochloric acid	✓			✓												✓								✓									

			Pollutants										Rinse Strategy								Group Destination																
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None		Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS	
94	G5	cascade rinse				✓								2				✓													✓					
95	G6	copper strike	✓		✓	✓													✓								✓									
96	G7	copper strike	✓		✓	✓													✓								✓									
97	G8	dragout rinse			✓	✓										✓														✓						
98	G9	cascade rinse			✓	✓								2				✓													✓					
99	G10	copper strike	✓		✓	✓													✓								✓									
100	G11	nickel activator	✓		✓	✓													✓								✓									
101	G12	nickel activator	✓		✓	✓													✓								✓									
102	G13	nickel strike	✓			✓													✓							✓										
103	G14	electroless nickel plate	✓					✓											✓							✓										
104	G15	electroless nickel plate	✓					✓											✓							✓										
105	G16	electroless nickel plate	✓					✓											✓							✓										
106	G17	electroless nickel plate	✓					✓											✓							✓										
107	H1	soak cleaner				✓													✓							✓										
108	H2	ultrasonic cleaner	✓			✓													✓							✓										
109	H3	empty	✓																✓															✓		
110	H4	empty	✓																✓															✓		
111	H5	DI rinse				✓										✓										✓										
112	AR1	solder strip	✓			✓													✓							✓										
113	AR2	solder strip				✓													✓							✓										
114	AR3	nitric acid	✓			✓													✓							✓										
115	AR4	nitric acid	✓			✓													✓							✓										
116	AR6	cascade rinse				✓								2				✓													✓					
117	AR10	acid cleaner	✓			✓													✓							✓										
118	AR12	sulfuric acid	✓			✓													✓							✓										
119	AR13	sulfuric acid	✓			✓													✓							✓										
120	AR15	cascade rinse				✓								2																	✓					
121	AR18	bright dip	✓			✓													✓							✓										
122	AR19	drag-out				✓										✓										✓										
123	AR20	bright dip	✓			✓													✓							✓										
124	AR21	bright dip	✓			✓													✓							✓										
125	M1	electroless nickel plate	✓					✓											✓							✓										

			Pollutants									Rinse Strategy								Group Destination															
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None	Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS
126	M2	electroless nickel plate	✓					✓										✓							✓									
127	M3	dragout rinse						✓							✓														✓					
128	M4	cascade rinse				✓							2																	✓				
129	M5	cobalt/gold plate	✓		✓	✓												✓								✓								
130	M6	cobalt/gold plate	✓		✓	✓												✓								✓								
131	M7	gold plate	✓		✓	✓												✓								✓								
132	M8	drag-out			✓	✓									✓														✓					
133	M9	cascade rinse			✓	✓							2																	✓				
134	M10	hot DI				✓									✓														✓					
135	M11	nickel strike	✓			✓												✓							✓									
136	M12	cascade rinse				✓							2																	✓				
137	M13	gold strike	✓		✓	✓												✓								✓								
138	M14	H2SO4 predip	✓			✓												✓							✓									
139	M15	rhodium plate	✓		✓	✓												✓								✓								
140	M16	nickel activator	✓			✓												✓							✓									
141	M16.5	anti-tarnish dip	✓			✓												✓							✓									
142	M17	gold drag-out	✓		✓	✓												✓								✓								
143	M18	gold plate	✓		✓	✓												✓								✓								
144	M19	gold strike	✓		✓	✓												✓								✓								
145	M20	cascade rine			✓	✓							2																	✓				
146	M21	copper drag-out				✓									✓														✓					
147	M22	copper strike	✓			✓												✓							✓									
148	M24	cascade rinse				✓							2																	✓				
149	M25	HCL acid dip	✓			✓												✓							✓									
150	M26	cascade rinse				✓							2																	✓				
151	M27	electrocleaner	✓			✓												✓							✓									
152	M28	electrocleaner	✓			✓												✓							✓									
153	M29	brite dip	✓			✓												✓							✓									
154	M30	cascade rinse				✓							2																	✓				
155	M31	H2SO4 acid dip	✓			✓												✓							✓									
156	Bd1	gold plate	✓		✓	✓												✓								✓								
157	Bd2	gold drag-out			✓	✓									✓														✓					

			Pollutants									Rinse Strategy								Group Destination															
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None	Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS
158	Bd3	gold plate	✓		✓	✓												✓								✓								
159	Bd4	cascade rinse			✓	✓							2																	✓				
160	Bd5	hot D.I. rinse				✓									✓												✓								
161	Bd9	gold plate	✓		✓	✓												✓									✓								
162	Bd10	soap cleaner	✓			✓												✓							✓										
163	L1-1	electrocleaner	✓			✓												✓							✓										
164	L1-2	HCL acid dip	✓			✓												✓							✓										
165	L1-3	nickel activator	✓			✓												✓							✓										
166	L1-4	nickel strike	✓			✓												✓							✓										
167	L1-4R	spray rinse				✓								✓																✓					
168	L1-5	nickel plate	✓			✓												✓							✓										
169	L1-5R	spray rinse				✓								✓																✓					
170	L1-7	gold strike	✓		✓	✓												✓								✓									
171	L1-8	gold drag-out			✓	✓									✓														✓						
172	L1-9	gold plate	✓		✓	✓												✓								✓									
173	L1-10	gold drag-out			✓	✓									✓														✓						
174	L2-1	electrocleaner	✓			✓												✓							✓										
175	L2-2	HCL dip	✓			✓												✓							✓										
176	L2-3	copper strike	✓			✓												✓							✓										
177	L2-4	nickel strike	✓			✓												✓							✓										
178	L2-5	nickel plate	✓			✓												✓							✓										
179	L2-6	nickel drag-out	✓			✓									✓											✓									
180	L2-9	gold plate	✓		✓	✓												✓								✓									
181	L2-10	gold drag-out			✓	✓									✓														✓						
182	EDD1	ultrasonic cleaner	✓			✓												✓							✓										
183	EDD2	cascade rinse				✓							2				✓													✓					
184	EDD3	deox cleaner	✓			✓												✓							✓										
185	EDD4	alkaline cleaner	✓			✓												✓							✓										
186	EDD5	hot D.I. rinse				✓						✓					✓													✓					
187	EDD6	cascade rinse				✓							2				✓													✓					
188	EDD7 A	brite dip	✓			✓												✓							✓										

			Pollutants									Rinse Strategy								Group Destination															
Ctrl #	Tank ID	Tank Name	Process	Hexavalent Chromium	Cyanide	General Heavy Metals	Electroless Copper	Electroless Nickel	Conventional Pollutant	Other	None	Running	Counter Current	Spray	Static	Recycle	Controller	None	Other	Cr f/b HM CTS	CN f/b HM CTS	CTS- Chrome Reduction	CTS- Cyanide Destruction	CTS - HM Precipitation	Batch Treatment	Wastehauled Offsite	Discharged to SP	Replenish	Return to Process Tank	pH Adjust Only	I.X.System	Electrowinning	Other	Bled to CTS
189	EDD7B	bright dip	✓			✓												✓							✓									
190	EDD8	cascade rinse				✓							2				✓												✓					
191	EDD9	dishwasher								✓				✓															✓					
192	EDD10	cascade rinse				✓							2				✓												✓					
193	EDD11	cascade rinse				✓							3				✓												✓					
194	EDD12	alcohol cleaner				✓									✓											✓								
195	EDD13	alcohol cleaner							✓						✓											✓								
196	EDD14	alcohol cleaner				✓									✓											✓								
197	EDD15	save this space									✓							✓															✓	
198	EDD16	acid cleaning	✓			✓												✓							✓									
199	EDD17	acid cleaning	✓			✓												✓							✓									
200	EDD18	not in use	✓			✓												✓							✓									
201	EDD19	cascade rinse				✓							2				✓												✓					
202	EDD20	Cu strike	✓		✓	✓												✓										✓						
203	EDD21	dragout rinse			✓	✓									✓											✓			✓					
204	EDD22	cascade rinse			✓	✓							2				✓												✓					
205	EDD23	EDTA rinse	✓			✓									✓											✓								
206	EDD24	copper plate	✓		✓	✓												✓										✓						
207	EDD25	cascade rinse			✓	✓							3				✓												✓					
208	EDD26	acid cleaner	✓			✓												✓							✓									
209	EDD27	Ni strike	✓			✓												✓										✓						
210	EDD28	dragout rinse				✓									✓											✓			✓					
211	EDD29	cascade rinse				✓							2				✓												✓					
212	EDD30	Watts Ni plating	✓			✓												✓										✓						
213	EDD31	cascade rinse				✓							3				✓												✓					
214	EDD32	hot D.I. rinse				✓						✓					✓												✓					

Waste Stream Destination Concern List

Pollutant	Tank ID	Tank Name	Group Destination	Comments
Cyanide	A5	cascade rinse	pH Adjust Only	Timer.

General Heavy Metals	A5	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	A9	running rinse	pH Adjust Only	Timer.
General Heavy Metals	A10	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	A14	running rinse	pH Adjust Only	Timer.
General Heavy Metals	B8	cascade rinse	pH Adjust Only	timer
General Heavy Metals	C2.5	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	C5	cascade rinse	pH Adjust Only	Timer.
Cyanide	C9	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	C9	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	C14	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	D2	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	D13	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	F6	cascade rinse	pH Adjust Only	Timer.
Cyanide	F11	spray rinse	pH Adjust Only	
General Heavy Metals	F11	spray rinse	pH Adjust Only	
General Heavy Metals	F16.5	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	G3	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	G5	cascade rinse	pH Adjust Only	Timer.
Cyanide	G9	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	G9	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	AR6	cascade rinse	pH Adjust Only	Timer.
General Heavy Metals	AR15	cascade rinse	pH Adjust Only	timer
General Heavy Metals	M4	cascade rinse	pH Adjust Only	
Cyanide	M9	cascade rinse	pH Adjust Only	
General Heavy Metals	M9	cascade rinse	pH Adjust Only	
General Heavy Metals	M12	cascade rinse	pH Adjust Only	timer
Cyanide	M20	cascade rine	pH Adjust Only	
General Heavy Metals	M20	cascade rine	pH Adjust Only	
General Heavy Metals	M24	cascade rinse	pH Adjust Only	timer
General Heavy Metals	M26	cascade rinse	pH Adjust Only	timer
General Heavy Metals	M30	cascade rinse	pH Adjust Only	timer
Cyanide	Bd4	cascade rinse	pH Adjust Only	timer
General Heavy Metals	Bd4	cascade rinse	pH Adjust Only	timer
General Heavy Metals	L1-4R	spray rinse	pH Adjust Only	
General Heavy Metals	L1-5R	spray rinse	pH Adjust Only	
General Heavy Metals	EDD2	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD5	hot D.I. rinse	pH Adjust Only	timer
General Heavy Metals	EDD6	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD8	cascade rinse	pH Adjust Only	timer
Other	EDD9	dishwasher	pH Adjust Only	labware use
General Heavy Metals	EDD10	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD11	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD19	cascade rinse	pH Adjust Only	timer
Cyanide	EDD22	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD22	cascade rinse	pH Adjust Only	timer
Cyanide	EDD25	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD25	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD29	cascade rinse	pH Adjust Only	timer

General Heavy Metals	EDD31	cascade rinse	pH Adjust Only	timer
General Heavy Metals	EDD32	hot D.I. rinse	pH Adjust Only	timer

Pretreatment Unit Processes

The following pretreatment unit processes are in place at this facility:

Continuous	Batch
☐Continuous Chromium Reduction	☒Multi-Purpose Batch Tank 1
☒Contin.Cyanide Destruct 1Stage	☒Multi-Purpose Batch Tank 2
☐Contin.Cyanide Destruct 2Stage	☐Multi-Purpose Batch Tank 3
☐Equalization tank	☐Batch Chrome Reduction
☐Contin. Chemical Precipitation	☐Batch Cyanide Destruct 1Stage
☒Effluent pH Adjustment	☐Batch Cyanide Destruct 2Stage
☐Continuous Coag/Floc	☐Batch Chemical Precipitation
☐pH Adjust Tank-No Heavy Metals	☐Batch Coagulation/Flocculation
☐Clarification neop	☒Plate & Frame Filter Press
☐Sludge Thickening Tank	☐Batch Chelate Breaking Tank
☒Clarification eop	☐Batch Clarification
☐Continuous O/W Sep	☐Sludge Thickening Tank
☐Polishing Filter	☒Polishing Filter
☐Plate & Frame Filter Press	☐Batch O/W Sep
☐Other Pressure Filtration Device	☒Electrowinning/Plateout
☐Ion Exchange	☐Effluent pH Adjustment
☐Anion Exchange	☐Anion Exchange
☐Cation Exchange	☐Cation Exchange
☐Mixed-Bed Ion Exchange	☐Mixed-Bed Ion Exchnage
☐Cross Flow Filter (Memtek)	☐Carbon Filtration
☐Sorption Filter (Lancy)	☒Holding Tank
☐Aluminum Chip	
☐Holding Tank	

The continuous pretreatment vessels include: Contin.Cyanide Destruct 1Stage; Effluent pH Adjustment; Clarification eop. The batch pretreatment vessels include: Multi-Purpose Batch Tank 1; Multi-Purpose Batch Tank 2; Plate & Frame Filter Press; Polishing Filter; Electrowinning/Plateout; Holding Tank.